CLAIMS

What is claimed is:

1. An apparatus for control of a fluid flow, comprising:
measuring means for measuring a pump performance parameter; and
controller means for adjusting a fluid flow in response to the pump performance parameter.

2. The apparatus of claim 1 wherein the measuring means comprises at least one sensor for measuring at least one of a pump speed, voltage, electric current, and electric power.

3. The apparatus of claim 1 wherein the measuring means comprises at least one of a voltage sensor, an electric current sensor, an electric power sensor, and a multi-component sensor.

4. The apparatus of claim 1 wherein the controller means comprises a process control computer for adjusting operation of at least one of a flow-control means and a pump.

5. The apparatus of claim 4 wherein the flow-control means comprises at least one of a valve, a pneumatic actuator, an electric actuator, a hydraulic actuator, and a micro-electric actuator.

6. The apparatus of claim 4 wherein the pump comprises a centrifugal pump.

7. An apparatus for control of a fluid flow, comprising:
measuring means for measuring a pump performance parameter;
means for comparing a measured pump performance parameter to a predetermined target pump performance parameter; and
controller means for adjusting a fluid flow in response to a difference in the measured pump performance parameter and the predetermined target pump performance parameter.

8. The apparatus of claim 7 wherein the measuring means comprises at least one sensor for measuring at least one of a pump speed, voltage, electric current, and electric power.

9. The apparatus of claim 7 wherein the measuring means comprises at least one of a voltage sensor, an electric current sensor, an electric power sensor, and a multi-component sensor.

10. The apparatus of claim 7 wherein the controller means comprises a process control computer for adjusting operation of at least one of a flow-control means and a pump.

11. The apparatus of claim 10 wherein the flow-control means comprises at least one of a valve, a pneumatic actuator, an electric actuator, a hydraulic actuator, and a micro-electric actuator.

12. The apparatus of claim 10 wherein the flow-control means comprises means for adjusting a system element to change the resistance to flow.

13. The apparatus of claim 10 wherein the pump comprises a centrifugal pump.

14. The apparatus of claim 7 further comprising means for delivering the fluid flow to means for performing a supercritical process.

15. An apparatus for control of a fluid flow, comprising:

a pump;

a sensor for measuring a pump performance parameter; and

a controller for adjusting operation of the pump to control a fluid flow in response to the pump performance parameter.

16. The apparatus of claim 15 wherein the pump performance parameter comprises at least one of a pump speed, voltage, electric current, and electric power.

17. A system for supercritical processing of an object, comprising:
means for performing a supercritical process;
means for measuring a pump performance parameter; and
means for adjusting operation of a pump to control a fluid flow in response to the pump performance parameter.

18. The system of claim 19 wherein the object is a semiconductor wafer for forming integrated circuits.

19. The system of claim 19 wherein the means for performing a supercritical process comprises a processing chamber and means for circulating at least one of a gaseous, liquid, supercritical and near-supercritical fluid within the processing chamber.

20. The system of claim 21 wherein the fluid comprises carbon dioxide.

21. The system of claim 22 wherein at least one of solvents, co-solvents and surfactants are contained in the carbon dioxide.

22. The system of claim 19 wherein the pump performance parameter comprises at least one of a pump speed, voltage, electric current, and electric power.

23. The system of claim 19 further comprising means for delivering the fluid flow to the means for performing a supercritical process.

24. A method of control of a fluid flow, comprising the steps of:
a. measuring a pump performance parameter; and
b. adjusting a fluid flow in response to the pump performance parameter.

25. The method of claim 26 wherein the pump operational parameter comprises at least one of a pump speed, voltage, electric current, and electric power.

26. A method of eliminating flow meter contamination in semiconductor wafer processing with a fluid, comprising the steps of:

a. measuring a pump operational parameter; and

b. adjusting operation of a pump to control a fluid flow in response to the pump operational parameter.

27. A method of control of a fluid flow, comprising the steps of:

measuring a pump performance parameter;

comparing a measured pump performance parameter to a predetermined target pump performance parameter; and

adjusting a fluid flow in response to a difference in the measured pump performance parameter and the predetermined target pump performance parameter.

28. A method of control of a fluid flow in a supercritical processing system, comprising the steps of:

a. defining a system curve including a point of operation;

b. using the system curve to define at least one of a predetermined pump speed, voltage, electric current, and electric power;

c. measuring performance of a pump to obtain at least one of a measured pump speed, voltage, electric current, and electric power;

d. comparing the at least one of a measured pump speed, voltage, electric current, and electric power to the at least one of a predetermined pump speed, voltage, electric current, and electric power;

e. adjusting operation of a pump to control a fluid flow in response to a difference in the at least one of a measured pump speed, voltage, electric current, and electric power and the at least one of a predetermined pump speed, voltage, electric current, and electric power.